



Northeast Fisheries Science Center Reference Document 15-09

doi:10.7289/V5MK69VR

Scotian Shelf Right Whale Aerial Survey Project July 18-30, 2014

by Timothy V.N. Cole and Allison G. Henry

August 2015

Scotian Shelf Right Whale Aerial Survey Project July 18-30, 2014

by Timothy V.N. Cole and Allison G. Henry

NOAA's National Marine Fisheries Serv., 166 Water St., Woods Hole MA 02543

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

August 2015

Northeast Fisheries Science Center Reference Documents

This series is a secondary scientific series designed to assure the long-term documentation and to enable the timely transmission of research results by Center and/or non-Center researchers, where such results bear upon the research mission of the Center (see the outside back cover for the mission statement). These documents receive internal scientific review, and most receive copy editing. The National Marine Fisheries Service does not endorse any proprietary material, process, or product mentioned in these documents.

All documents issued in this series since April 2001, and several documents issued prior to that date, have been copublished in both paper and electronic versions. To access the electronic version of a document in this series, go to <http://nefsc.noaa.gov/publications/>. The electronic version is available in PDF format to permit printing of a paper copy directly from the Internet. If you do not have Internet access, or if a desired document is one of the pre-April 2001 documents available only in the paper version, you can obtain a paper copy by contacting the senior Center author of the desired document. Refer to the title page of the document for the senior Center author's name and mailing address. If there is no Center author, or if there is corporate (*i.e.*, non-individualized) authorship, then contact the Center's Woods Hole Laboratory Library (166 Water St., Woods Hole, MA 02543-1026).

Information Quality Act Compliance: In accordance with section 515 of Public Law 106-554, the Northeast Fisheries Science Center completed both technical and policy reviews for this report. These predissemination reviews are on file at the NEFSC Editorial Office.

This document may be cited as:

Cole TVN, Henry AG. 2015. Scotian Shelf Right Whale Aerial Survey Project July 18-30, 2014. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-09; 8 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543- 1026, or online at <http://nefsc.noaa.gov/publications/>
doi:10.7289/V5MK69VR

Table of Contents

| | |
|---|---|
| Overview | 1 |
| Table 1. Right whale sighting details from NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 1 |
| Table 2. Summary of time on effort, Beaufort sea conditions, and sightings from NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 2 |
| Table 3. Flight log notes from NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014..... | 3 |
| Table 4. Project participants and affiliations in NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 3 |
| Figure 1. Completed survey track lines and sightings of baleen whale species during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 4 |
| Figure 2. Completed survey track lines and sightings of toothed whale species and harbor porpoise during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 5 |
| Figure 3. Completed survey track lines and sightings of dolphins during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 6 |
| Figure 4. Completed survey track lines and sightings of basking sharks, leatherback turtles, and tuna during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 7 |
| Figure 5. Completed survey track lines and sightings of ocean sunfish during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014 | 8 |

Overview

National Oceanic and Atmospheric Administration (NOAA) funding and Fisheries and Oceans Canada (DFO) collaboration provided the opportunity for the Northeast Fisheries Science Center (NEFSC) right whale aerial survey team to follow right whales into Canadian waters after completing surveys in the waters off the Northeast United States. We completed eight flights in several areas of the Scotian Shelf during July 18-30, 2014, under SARA Section 73 Permit # 330996. From a Twin Otter flying at 230m and 100 knots, two observers scanned the ocean surface for megafauna for a total of 22 hours and 16 minutes of visual effort. Eleven right whales were sighted and photographed for individual identification. One was previously injured and is on a list of whales whose health status is being monitored (Right Whale Catalog #1203). Right whale sighting details are provided in Table 1. Table 2 provides the numbers of other megafauna species recorded on each flight. Table 3 provides flight log notes. Table 4 lists the project's participants. Figures 1-5 show completed track lines and locations of sightings. The images taken of right whales have been submitted to the North Atlantic Right Whale Catalog at the New England Aquarium in Boston, MA, for individual identification. Copies of the survey data and right whale images are available from Tim Cole.

Table 1. Right whale sighting details from NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

| Date | Number | Lat/Lon | Notes |
|-----------|--------|---------------------|--|
| 7/18/2014 | 1 | 42 19.4 N 66 53.6 W | Healthy. Traveling northwest. |
| - | 2 | 42 10.0 N 66 03.0 W | Healthy. Off watch sighting. |
| - | 1 | 42 20.8 N 66 16.3 W | Healthy. |
| 7/19/2014 | 1 | 42 44.1 N 65 23.1 W | Healthy. |
| - | 1 | 43 12.7 N 65 03.8 W | Previously injured. Traveling south. |
| 7/22/2014 | 5 | 43 37.7 N 63 20.8 W | Healthy. Traveling northeast together. |

Table 2. Summary of time on effort, Beaufort sea conditions, and sightings from NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014. Numbers of animals are the totals of recorded group sizes from each flight.

| Date | 7/18/2014 | 7/19/2014 | 7/19/2014 | 7/22/2014 | 7/25/2014 | 7/26/2014 | 7/27/2014 | 7/30/2014 |
|-----------------------|---------------|---------------|-------------------------|--------------------------|--------------------------|---|------------|------------------------|
| Area surveyed | Georges Basin | Roseway Basin | Scotian Shelf Edge West | Emerald & Lahave Central | Emerald & Lahave Central | Emerald & Lahave South and Scotian Shelf East | Canso Bank | Northern Gulf of Maine |
| Time on effort (h:mm) | 2:57 | 3:51 | 1:46 | 2:40 | 2:06 | 4:28 | 4:03 | 0:25 |
| Beaufort conditions | 1-5 | 1-3 | 0-2 | 3-5 | 1-4 | 2-5 | 2-5 | 2 |
| Sightings | | | | | | | | |
| right whale | 4 | 2 | | 5 | | | | |
| humpback whale | 1 | 4 | 1 | 1 | 2 | 8 | 1 | |
| fin whale | | 13 | 5 | 6 | 7 | 5 | 2 | |
| sei whale | 4 | 1 | | | | | | |
| fin/sei | 1 | 2 | | 2 | 1 | | | |
| whale spp | 1 | 11 | 3 | 2 | 3 | 7 | | |
| minke whale | 4 | 6 | | 1 | | 2 | 3 | 1 |
| sperm whale | 1 | | | | | 2 | | |
| killer whale | | 1 | | | | | | |
| pilot whale | 2 | | 40 | | | 29 | | |
| Risso's dolphin | | | | | | 6 | | |
| bottlenose dolphin | | | | | | | | |
| white-beaked dolphin | | 12 | | | | | | |
| white-sided dolphin | 193 | 12 | 790 | 10 | | | | |
| common dolphin | | 2 | | | | 2 | | |
| common/white-sided | 24 | 60 | 110 | | 130 | 30 | 142 | |
| dolphin spp | 617 | 843 | 351 | | 39 | 154 | 43 | |
| harbor porpoise | 1 | 32 | | | | | | |
| leatherback turtle | | | | | | 1 | 7 | |
| basking shark | 7 | 12 | | 1 | 3 | 1 | 1 | 5 |
| ocean sunfish | 14 | 61 | 34 | 8 | 62 | 44 | 24 | 2 |
| tuna spp | | 3 | | | | | | |

Table 3. Flight log notes from NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

| | | |
|-----------|--|--|
| 7/18/2014 | Georges Basin | Surveyed in excellent to moderate conditions. Completed zig and half of zag due to fuel constraints. Fishing gear light in western portion. |
| 7/19/2014 | Roseway Basin | Survey completed in excellent to good conditions. Fishing gear sparse. Refueled in Yarmouth. |
| 7/19/2014 | Scotian Shelf Edge West | Surveyed in excellent conditions. Only completed zig due to limited daylight. No fishing gear seen. |
| 7/22/2014 | Emerald & Lhave Central | Surveyed in excellent to moderate conditions. Cut southeast point of zig and eastern most line of zag due to fog. No fishing gear seen. |
| 7/25/2014 | Emerald & Lhave Central | Aborted Emerald/Lhave South & Scotian Shelf West due to low ceilings. Surveyed zig (cut 1st line) of Emerald/Lhave Central and return transit in excellent conditions. No fishing gear seen. Lei Harris (DFO) onboard. |
| 7/26/2014 | Emerald & Lhave South and Scotian Shelf East | Completed W to E zig of Emerald/Lhave South and E to W zig of Scotian Shelf East, including transits, in excellent to moderate conditions. No fishing gear seen. Mike James & Lei Harris (DFO) onboard. |
| 7/27/2014 | Canso Bank | Surveyed in excellent to good conditions. Refueled in Sydney. Surveyed for an additional 29 minutes while transiting to Sydney. Surveyed for another 29 minutes along coastline during return transit to Halifax. Fishing gear light in NE corner, moderate in SE corner, light on transit to/from Sydney. |
| 7/30/2014 | Northern Gulf of Maine | Surveyed portions of line 1, 6, 7, 10. Cut all others due to fog. Refueled in Bangor. No fishing gear seen. |

Table 4. Project participants and affiliations NEFSC aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

| | | |
|-----------------|---------------|------------------------------------|
| Tim Cole | Observer | Northeast Fisheries Science Center |
| Heather Nicotri | Observer | Integrated Statistics |
| Lei Harris | Observer | Fisheries and Oceans Canada |
| Mike James | Observer | Fisheries and Oceans Canada |
| Allison Henry | Data recorder | Northeast Fisheries Science Center |
| Kevin Doremus | Pilot | NOAA Aircraft Operations Center |
| Jason Mansour | Pilot | NOAA Aircraft Operations Center |
| Tanner Sims | Pilot | NOAA Aircraft Operations Center |

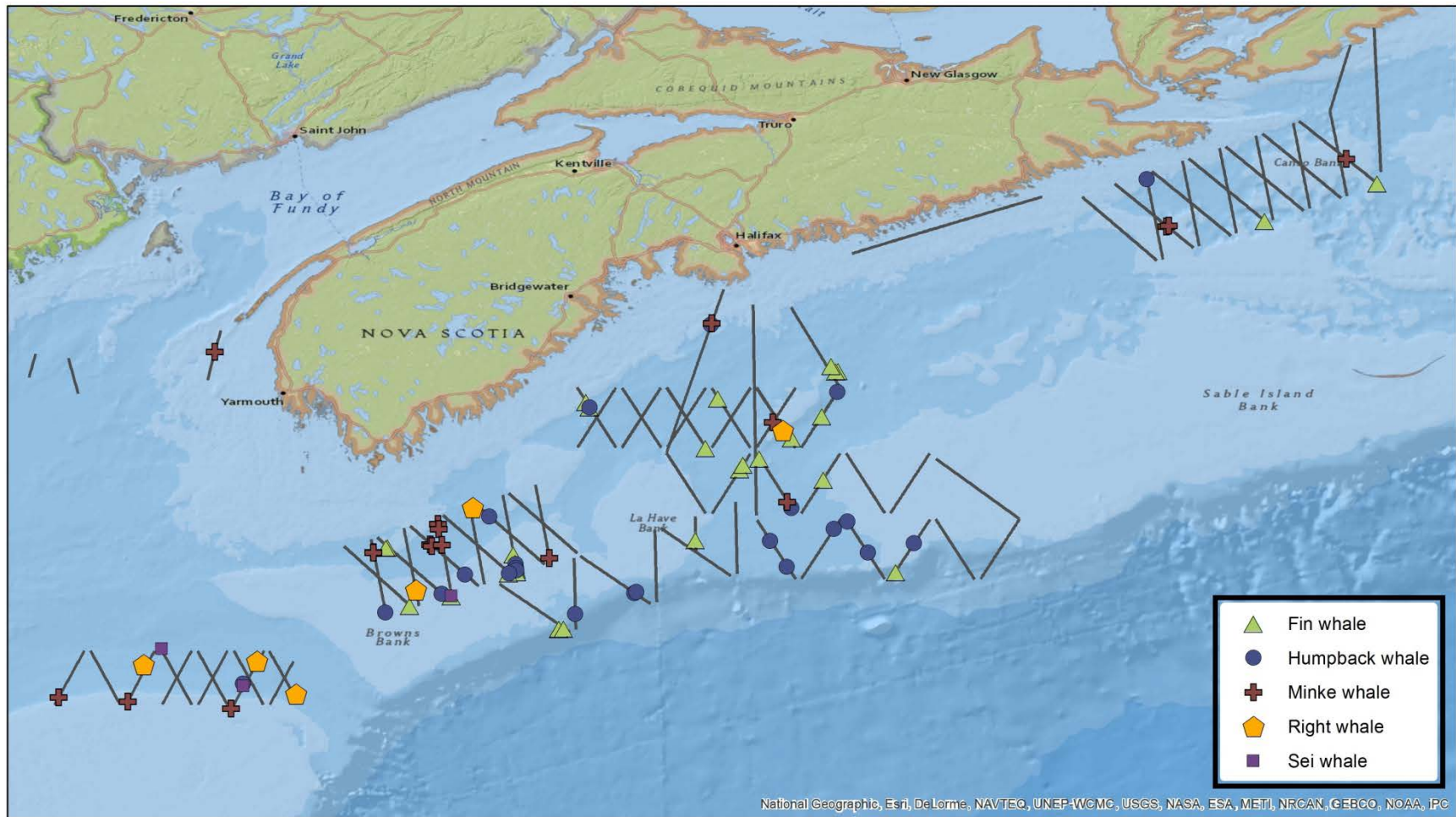


Figure 1. Completed survey track lines and sightings of baleen whale species during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

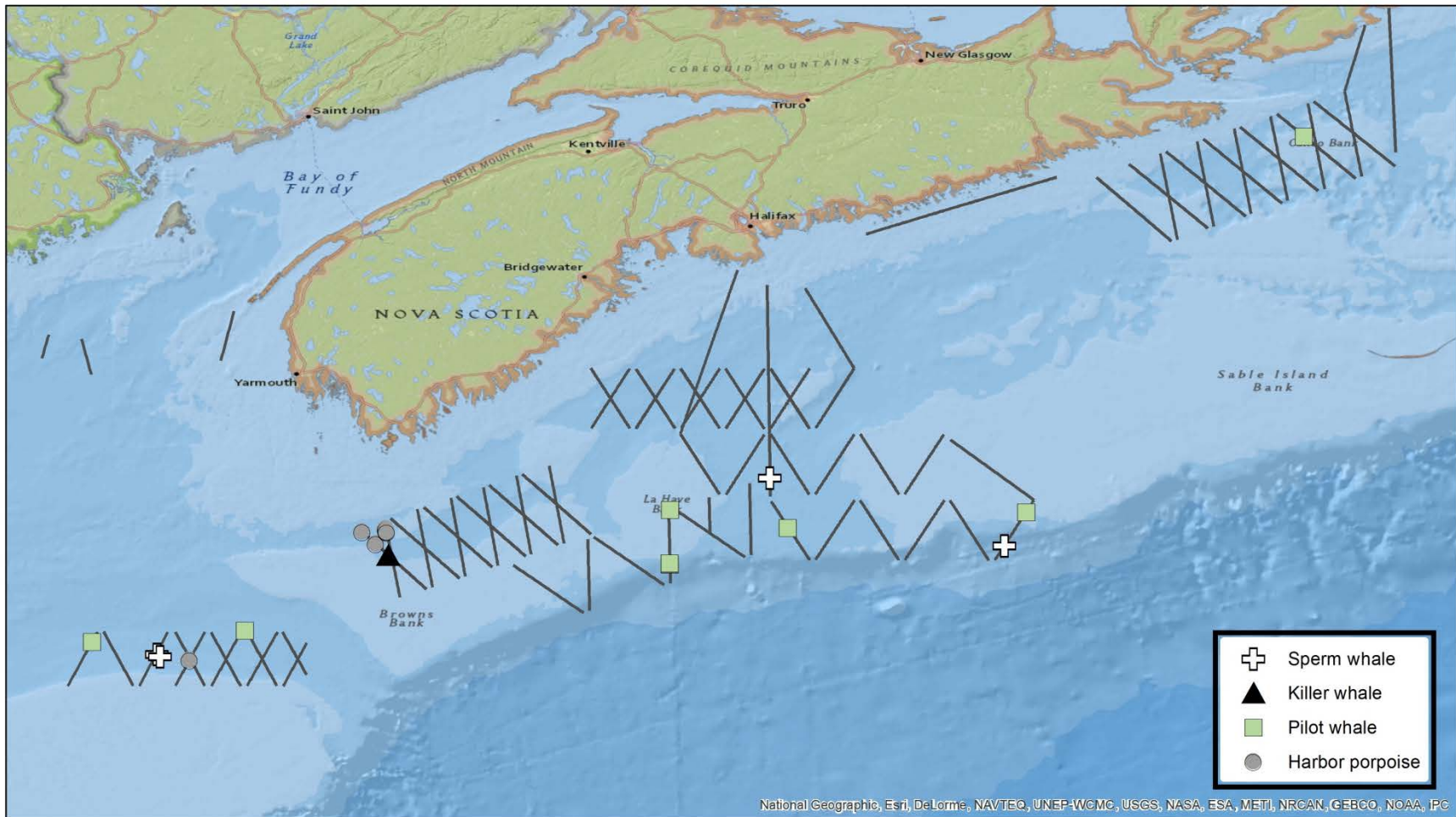


Figure 2. Completed survey track lines and sightings of toothed whale species and harbor porpoise during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

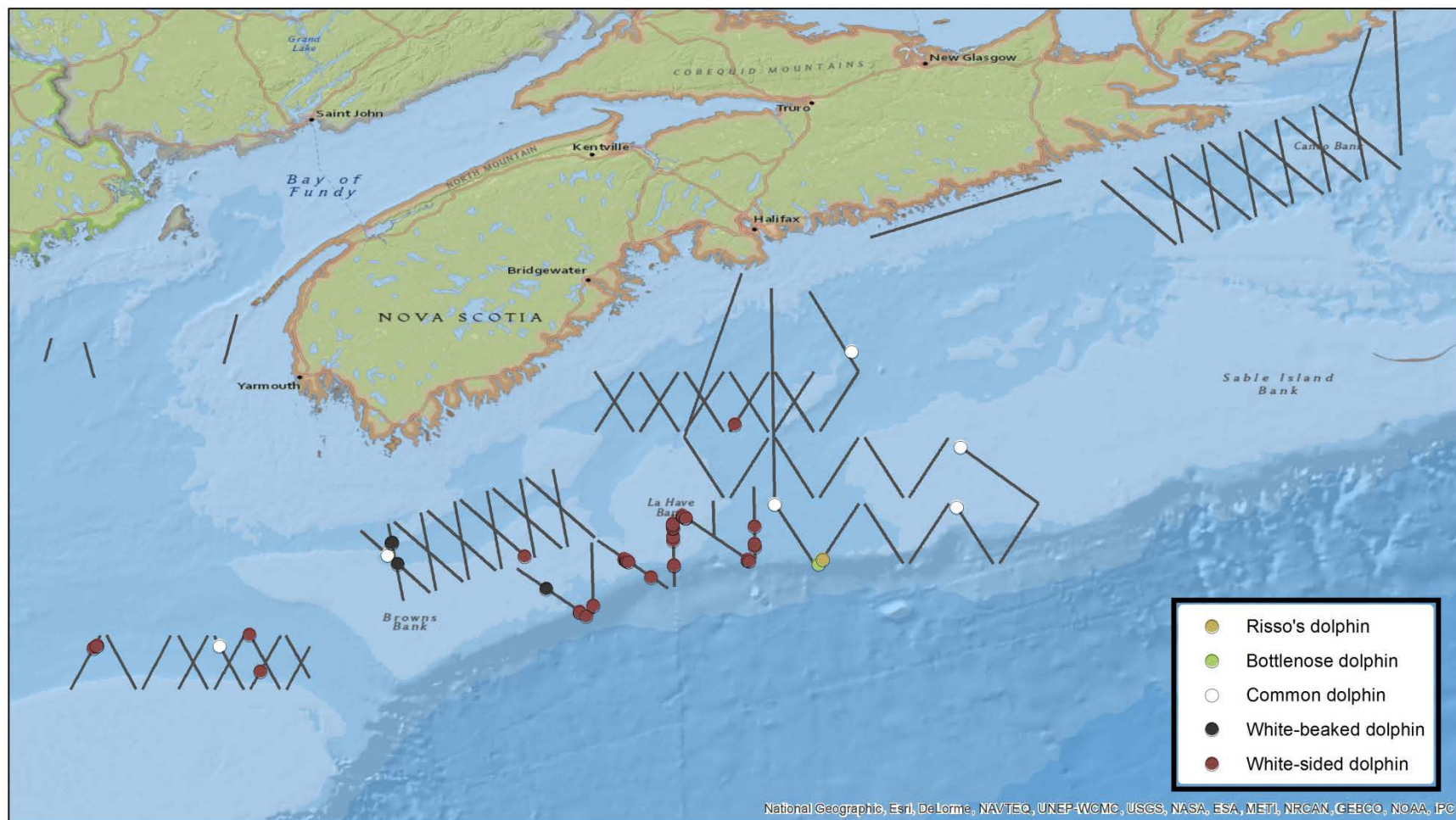


Figure 3. Completed survey track lines and sightings of dolphins during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

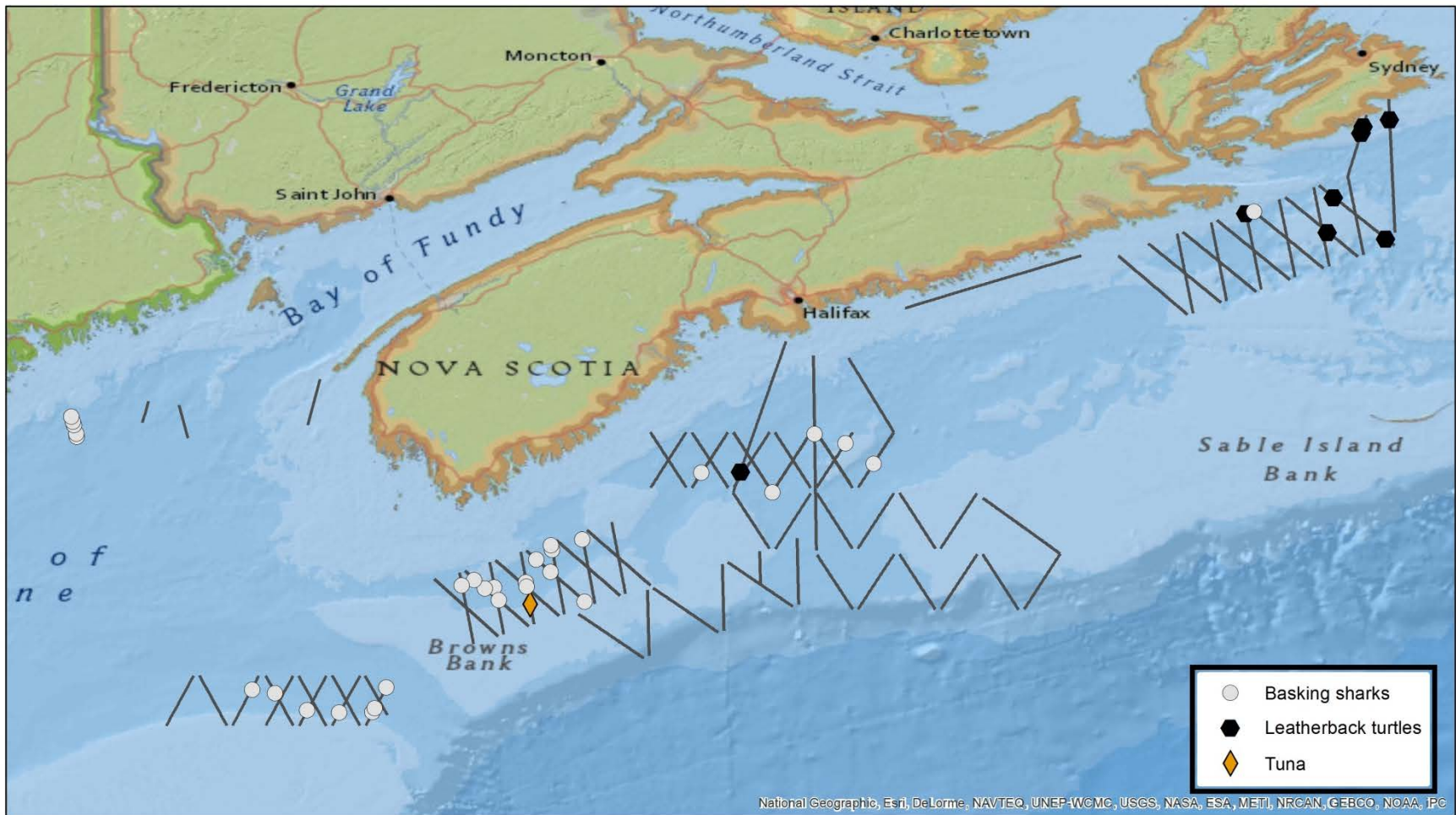


Figure 4. Completed survey track lines and sightings of basking sharks, leatherback turtles, and tuna during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

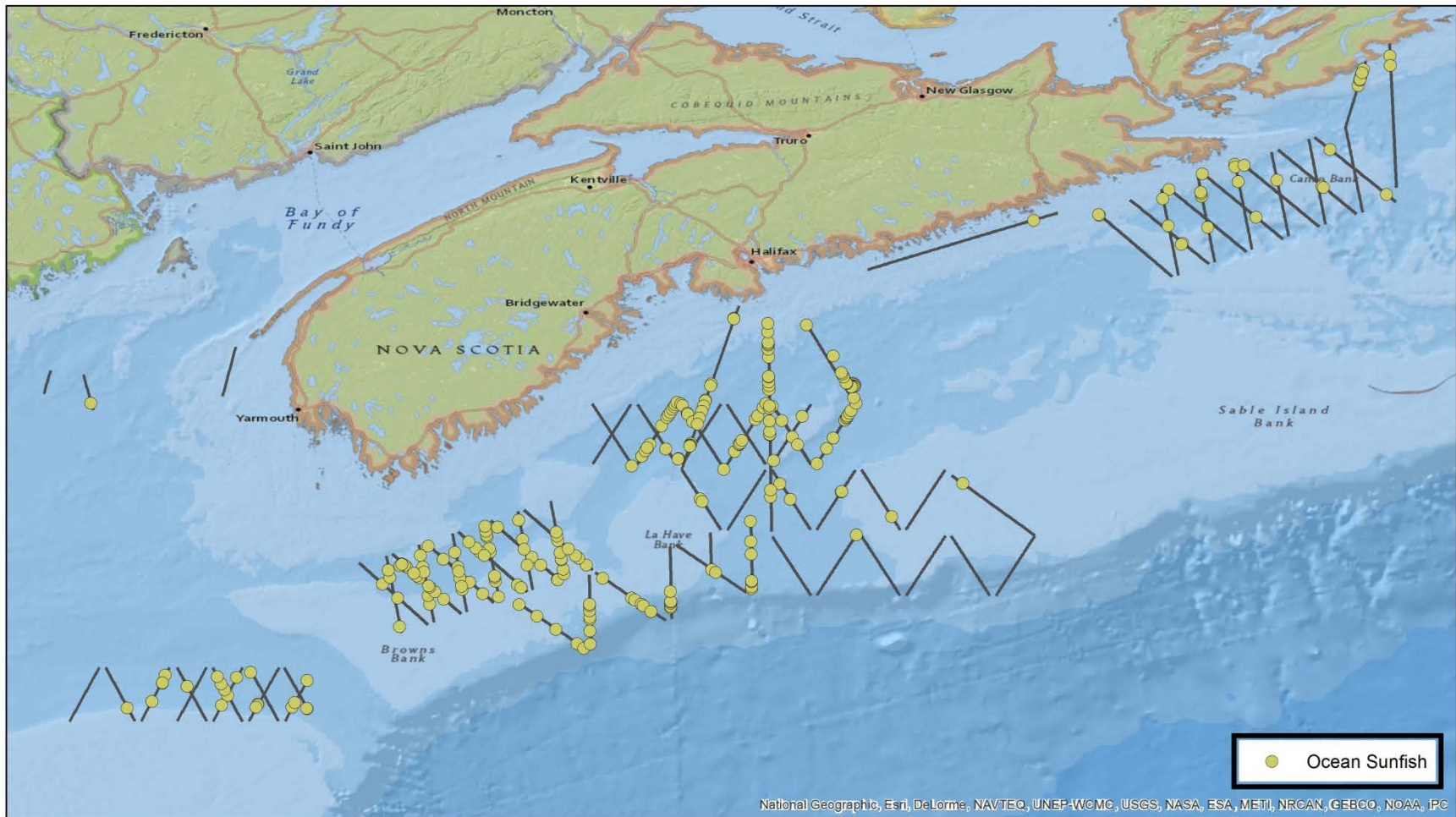


Figure 5. Completed survey track lines and sightings of ocean sunfish during NOAA aerial surveys of the Scotian Shelf, July 18 – 30, 2014.

Procedures for Issuing Manuscripts in the *Northeast Fisheries Science Center Reference Document (CRD) Series*

Clearance

All manuscripts submitted for issuance as CRDs must have cleared the NEFSC's manuscript/abstract/webpage review process. If any author is not a federal employee, he/she will be required to sign an "NEFSC Release-of-Copyright Form." If your manuscript includes material from another work which has been copyrighted, then you will need to work with the NEFSC's Editorial Office to arrange for permission to use that material by securing release signatures on the "NEFSC Use-of-Copyrighted-Work Permission Form."

For more information, NEFSC authors should see the NEFSC's online publication policy manual, "Manuscript/abstract/webpage preparation, review, and dissemination: NEFSC author's guide to policy, process, and procedure," located in the Publications/Manuscript Review section of the NEFSC intranet page.

Organization

Manuscripts must have an abstract and table of contents, and (if applicable) lists of figures and tables. As much as possible, use traditional scientific manuscript organization for sections: "Introduction," "Study Area" and/or "Experimental Apparatus," "Methods," "Results," "Discussion," "Conclusions," "Acknowledgments," and "Literature/References Cited."

Style

The CRD series is obligated to conform with the style contained in the current edition of the United States Government Printing Office Style Manual. That style manual is silent on many aspects of scientific manuscripts. The CRD series relies more on the CSE Style Manual. Manuscripts should be prepared to conform with these style manuals.

The CRD series uses the American Fisheries Society's guides to names of fishes, mollusks, and decapod

crustaceans, the Society for Marine Mammalogy's guide to names of marine mammals, the Biosciences Information Service's guide to serial title abbreviations, and the ISO's (International Standardization Organization) guide to statistical terms.

For in-text citation, use the name-date system. A special effort should be made to ensure that all necessary bibliographic information is included in the list of cited works. Personal communications must include date, full name, and full mailing address of the contact.

Preparation

Once your document has cleared the review process, the Editorial Office will contact you with publication needs – for example, revised text (if necessary) and separate digital figures and tables if they are embedded in the document. Materials may be submitted to the Editorial Office as files on zip disks or CDs, email attachments, or intranet downloads. Text files should be in Microsoft Word, tables may be in Word or Excel, and graphics files may be in a variety of formats (JPG, GIF, Excel, PowerPoint, etc.).

Production and Distribution

The Editorial Office will perform a copy-edit of the document and may request further revisions. The Editorial Office will develop the inside and outside front covers, the inside and outside back covers, and the title and bibliographic control pages of the document.

Once both the PDF (print) and Web versions of the CRD are ready, the Editorial Office will contact you to review both versions and submit corrections or changes before the document is posted online.

A number of organizations and individuals in the Northeast Region will be notified by e-mail of the availability of the document online.

Research Communications Branch
Northeast Fisheries Science Center
National Marine Fisheries Service, NOAA
166 Water St.
Woods Hole, MA 02543-1026

**MEDIA
MAIL**

Publications and Reports of the Northeast Fisheries Science Center

The mission of NOAA's National Marine Fisheries Service (NMFS) is "stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of their environment." As the research arm of the NMFS's Northeast Region, the Northeast Fisheries Science Center (NEFSC) supports the NMFS mission by "conducting ecosystem-based research and assessments of living marine resources, with a focus on the Northeast Shelf, to promote the recovery and long-term sustainability of these resources and to generate social and economic opportunities and benefits from their use." Results of NEFSC research are largely reported in primary scientific media (*e.g.*, anonymously-peer-reviewed scientific journals). However, to assist itself in providing data, information, and advice to its constituents, the NEFSC occasionally releases its results in its own media. Currently, there are three such media:

NOAA Technical Memorandum NMFS-NE -- This series is issued irregularly. The series typically includes: data reports of long-term field or lab studies of important species or habitats; synthesis reports for important species or habitats; annual reports of overall assessment or monitoring programs; manuals describing program-wide surveying or experimental techniques; literature surveys of important species or habitat topics; proceedings and collected papers of scientific meetings; and indexed and/or annotated bibliographies. All issues receive internal scientific review and most issues receive technical and copy editing.

Northeast Fisheries Science Center Reference Document -- This series is issued irregularly. The series typically includes: data reports on field and lab studies; progress reports on experiments, monitoring, and assessments; background papers for, collected abstracts of, and/or summary reports of scientific meetings; and simple bibliographies. Issues receive internal scientific review and most issues receive copy editing.

Resource Survey Report (formerly *Fishermen's Report*) -- This information report is a regularly-issued, quick-turnaround report on the distribution and relative abundance of selected living marine resources as derived from each of the NEFSC's periodic research vessel surveys of the Northeast's continental shelf. This report undergoes internal review, but receives no technical or copy editing.

TO OBTAIN A COPY of a *NOAA Technical Memorandum NMFS-NE* or a *Northeast Fisheries Science Center Reference Document*, either contact the NEFSC Editorial Office (166 Water St., Woods Hole, MA 02543-1026; 508-495-2350) or consult the NEFSC webpage on "Reports and Publications" (<http://www.nefsc.noaa.gov/nefsc/publications/>). To access *Resource Survey Report*, consult the Ecosystem Surveys Branch webpage (<http://www.nefsc.noaa.gov/femad/ecosurvey/mainpage/>).

ANY USE OF TRADE OR BRAND NAMES IN ANY NEFSC PUBLICATION OR REPORT DOES NOT IMPLY ENDORSEMENT.